

Phenolic Impregnated Carbon Ablator (PICA) Gap Filler for Heat Shield Assemblies, Phase II

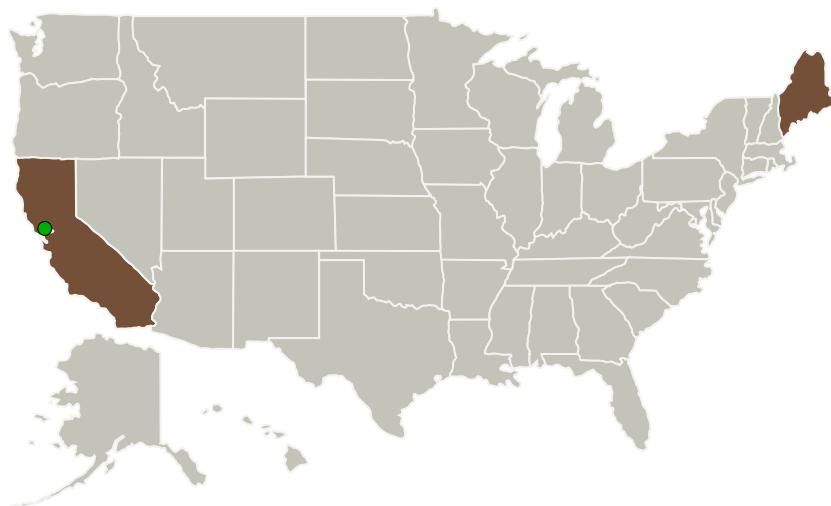
Completed Technology Project (2011 - 2013)



Project Introduction

During this program, Fiber Materials, Inc. (FMI) will develop practical methods for preparing Phenolic Impregnated Carbon Ablator (PICA) materials for joining thermal protection system segments and penetrations of the heat shield assembly. Current and future mission flight environments and designs, such as those for Mars Science Laboratory Aeroshell (MSLA) and anticipated for New Frontiers and Mars EDL missions, will be assessed. Capability of the developed solution(s) will address mechanical and thermal robustness, and performance under representative mission heating environment. The Phase 1 program evaluated candidate joining and gap-fill materials, and assessed joining design approaches for cost effective manufacturability and assembly. Material joining design, assembly methodology and material test performance was documented. The Phase 2 program will utilize materials developed during the Phase 1 program to test performance under representative environment(s). A down-selected material-joining approach will result in the design and fabrication of a mission-specific PICA sub-assembly. The prototype sub-assembly will demonstrate assembly methods and the prototype materials will be utilized for characterization and performance testing. The proposed materials, designs and methods are TRL ≤ 3 . It is anticipated that TRL ≥ 6 will be achieved at the conclusion of a successful phase 2 program.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Fiber Materials, Inc.	Lead Organization	Industry	Biddeford, Maine
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Maine

Project Transitions

▶ **August 2011:** Project Start

✓ **December 2013:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/139212>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Fiber Materials, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

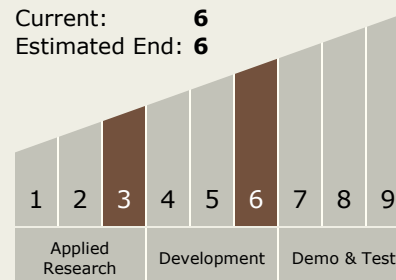
Carlos Torrez

Principal Investigator:

Steven Violette

Technology Maturity (TRL)

Start: 3
Current: 6
Estimated End: 6



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Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
 - └ TX09.1 Aeroassist and Atmospheric Entry
 - └ TX09.1.1 Thermal Protection Systems

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System